

FIG. 2

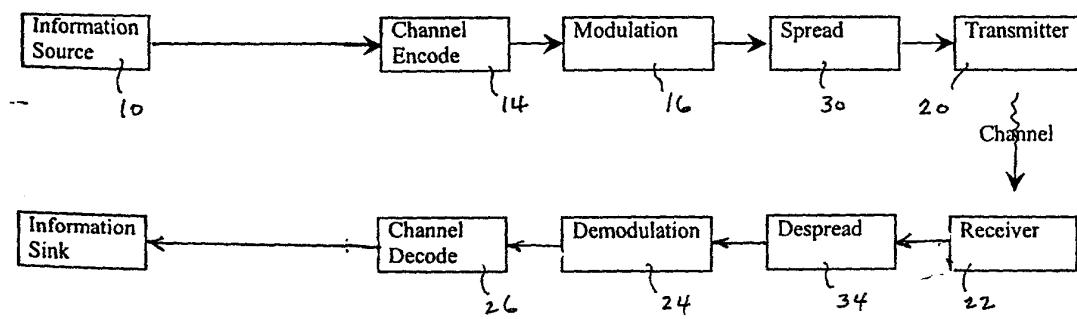


FIG. 1

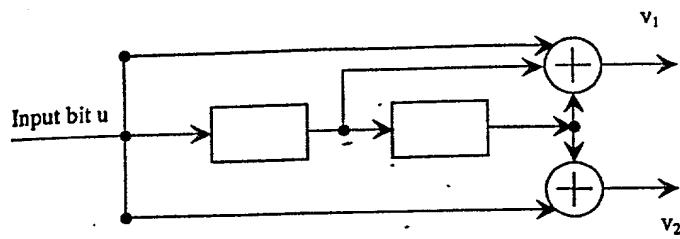


FIG. 3

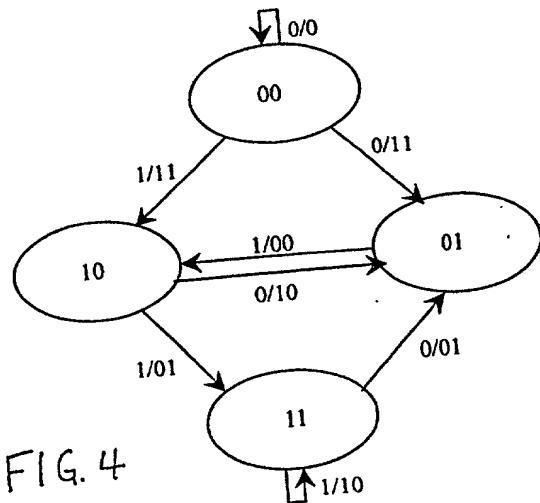
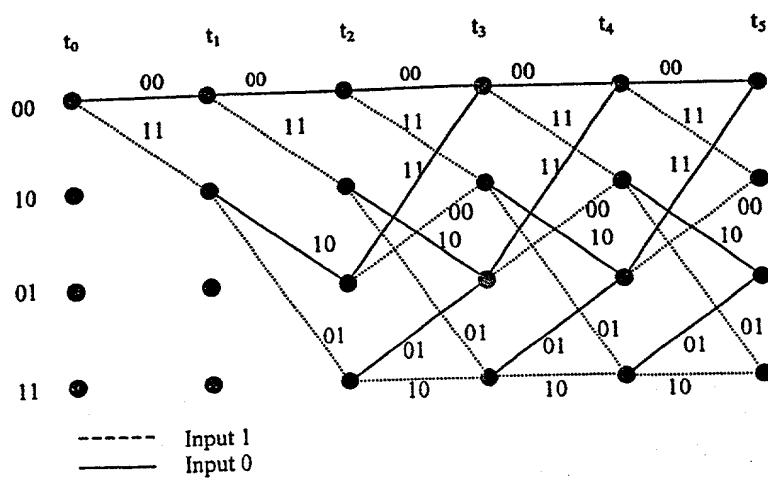


FIG. 4



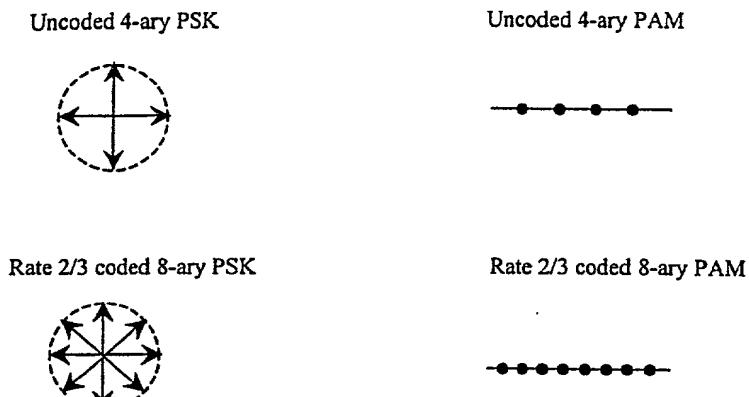


FIG. 6

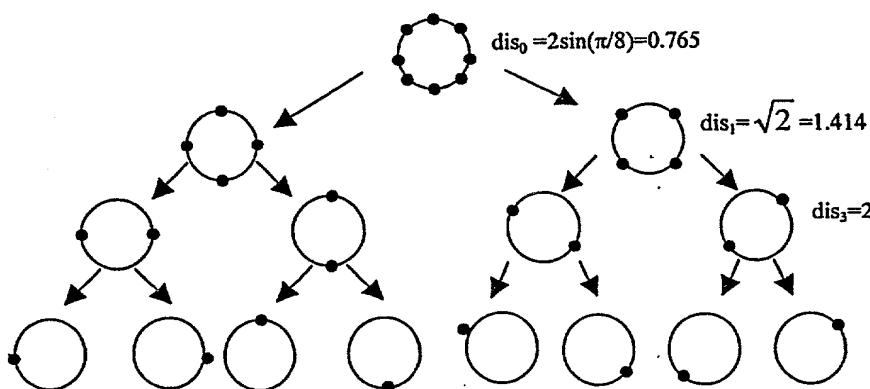


FIG. 7

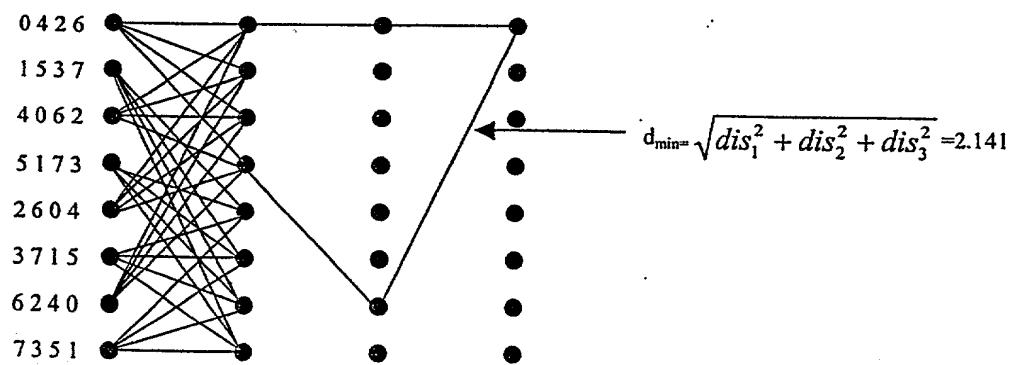


FIG. 8

Table 1 - State Transition Table for CTCM (4,3)

State	Input 0	Input 1	Input 2	Input 3
1	1	2	5	34
2	3	8	15	37
3	4	14	10	50
4	5	34	1	2
5	6	26	11	47
6	7	64	17	25
7	8	3	37	15
8	9	28	29	20
9	10	50	4	14
10	11	47	6	26
11	12	63	31	62
12	13	27	53	55
13	14	4	50	10
14	15	37	3	8
15	16	54	30	43
16	17	25	7	64
17	18	35	40	51
18	19	49	57	42
19	20	29	28	9
20	21	58	38	56
21	22	61	52	24
22	23	44	32	48
23	24	52	61	22
24	25	17	64	7
25	26	6	47	11
26	27	13	55	53
27	28	9	20	29
28	29	20	9	28
29	30	43	16	54
30	31	62	12	63
31	32	48	23	44
32	33	36	46	39

State	Input 0	Input 1	Input 2	Input 3
33	34	5	2	1
34	35	18	51	40
35	36	33	39	46
36	37	15	8	3
37	38	56	21	58
38	39	46	36	33
39	40	51	18	35
40	41	45	59	60
41	42	57	49	19
42	43	30	54	16
43	44	23	48	32
44	45	41	60	59
45	46	39	33	36
46	47	11	26	6
47	48	32	44	23
48	49	19	42	57
49	50	10	14	4
50	51	40	35	18
51	52	24	22	61
52	53	55	13	27
53	54	16	43	30
54	55	53	27	13
55	56	38	58	21
56	57	42	19	49
57	58	21	56	38
58	59	60	41	45
59	60	59	45	41
60	61	22	24	52
61	62	31	63	12
62	63	12	62	31
63	64	7	25	17
64	2	1	34	5

FIG. 9

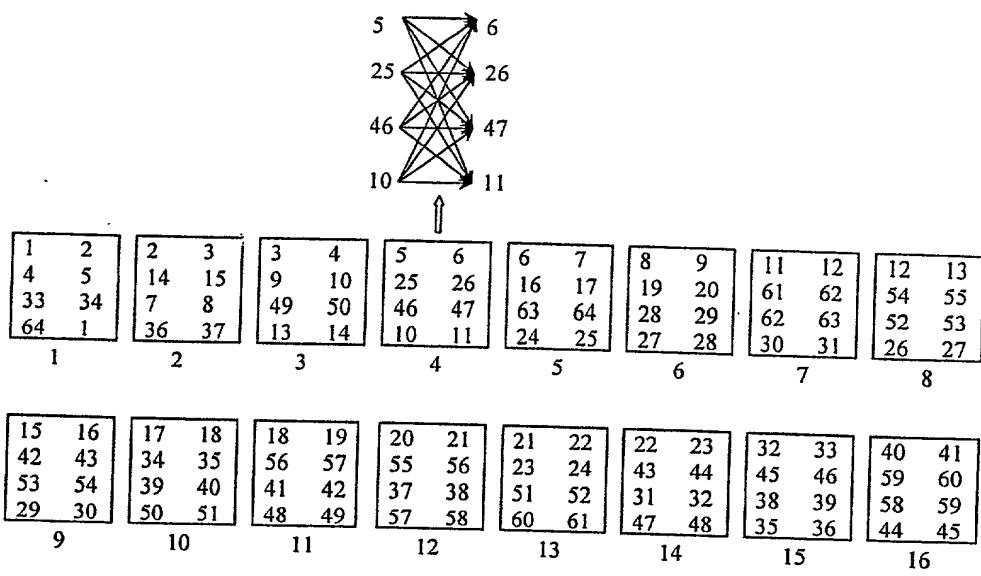


FIG. 10

stage 1 2 ... i ... D D+1

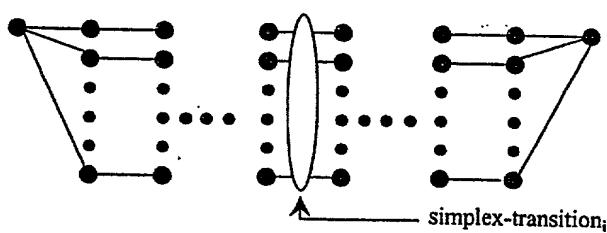


FIG. 11

TABLE 2

1	1	1	1	1
1	2	3	4	1
1	5	6	64	1
1	34	35	33	1
2	3	4	1	2
2	8	9	4	2
2	15	16	64	2
2	37	38	33	2
3	4	1	2	3
3	14	3	14	3
3	10	6	7	3
3	50	35	36	3
4	5	26	13	4
4	34	18	49	4
4	1	2	3	4
4	2	8	9	4
5	6	64	1	5
5	26	13	4	5
5	11	63	64	5
5	47	32	33	5
6	7	3	10	6
6	64	1	5	6
6	17	35	46	6
6	25	6	25	6
7	8	29	16	7
7	3	10	6	7
7	37	21	24	7
7	15	30	63	7
8	9	4	2	8
8	28	9	14	8
8	29	16	7	8
8	20	38	36	8
9	10	26	27	9
9	50	18	19	9
9	4	2	8	9
9	14	8	28	9
10	11	12	13	10
10	47	48	49	10
10	6	7	3	10
10	26	27	9	10
11	12	13	10	11

11	63	64	5	11
11	31	32	46	11
11	62	63	25	11
12	13	10	11	12
12	27	29	30	12
12	53	30	62	12
12	55	21	61	12
13	14	15	54	13
13	4	5	26	13
13	50	51	52	13
13	10	11	12	13
14	15	54	13	14
14	37	56	49	14
14	3	14	3	14
14	8	28	9	14
15	16	64	2	15
15	54	13	14	15
15	30	63	7	15
15	43	32	36	15
16	17	18	42	16
16	25	26	53	16
16	7	8	29	16
16	64	2	15	16
17	18	42	16	17
17	35	46	6	17
17	40	60	24	17
17	51	61	63	17
18	19	9	50	18
18	49	4	34	18
18	57	38	39	18
18	42	16	17	18
19	20	58	41	19
19	29	43	48	19
19	28	20	56	19
19	9	50	18	19
20	21	52	27	20
20	58	41	19	20
20	38	36	8	20
20	56	19	28	20
21	22	48	57	21
21	61	12	55	21

FIG. 12A

TABLE 2 (CONT.)

21	52	27	20	21
21	24	7	37	21
22	23	22	23	22
22	44	59	60	22
22	32	39	51	22
22	48	57	21	22
23	24	25	47	23
23	52	53	43	23
23	61	62	31	23
23	22	23	22	23
24	25	47	23	24
24	17	40	60	24
24	64	34	51	24
24	7	37	21	24
25	26	53	16	25
25	6	25	6	25
25	47	23	24	25
25	11	62	63	25
26	27	9	10	26
26	13	4	5	26
26	55	38	46	26
26	53	16	25	26
27	28	29	54	27
27	9	10	26	27
27	20	21	52	27
27	29	30	12	27
28	29	54	27	28
28	20	56	19	28
28	9	14	8	28
28	28	28	28	28
29	30	12	27	29
29	43	48	19	29
29	16	7	8	29
29	54	27	28	29
30	31	48	42	30
30	62	12	53	30
30	12	27	29	30
30	63	7	15	30
31	32	46	11	31
31	48	42	30	31
31	23	61	62	31
31	44	60	61	31
32	33	5	47	32
32	36	15	43	32
32	46	11	31	32
32	39	51	22	32
33	34	40	45	33
33	5	47	32	33
33	2	37	38	33
33	1	34	35	33
34	35	33	1	34
34	18	49	4	34
34	51	24	64	34
34	40	45	33	34
35	36	3	50	35
35	33	1	34	35
35	39	35	39	35
35	46	6	17	35
36	37	58	45	36
36	15	43	32	36
36	8	20	38	36
36	3	50	35	36
37	38	33	2	37
37	56	49	14	37
37	21	24	7	37
37	58	45	36	37
38	39	18	57	38
38	46	26	55	38
38	36	8	20	38
38	33	2	37	38
39	40	59	45	39
39	51	22	32	39
39	18	57	38	39
39	35	39	35	39
40	41	49	50	40
40	45	33	34	40
40	59	45	39	40
40	60	24	17	40
41	42	43	44	41
41	57	58	59	41
41	49	50	40	41
41	19	20	58	41
42	43	44	41	42
42	30	31	48	42
42	54	55	56	42
42	16	17	18	42
43	44	41	42	43
43	23	52	53	43
43	48	19	29	43
43	32	36	15	43
44	45	46	47	44
44	41	42	43	44
44	60	61	31	44
44	59	60	22	44
45	46	47	44	45
45	39	40	59	45
45	33	34	40	45
45	36	37	58	45

TABLE 2 (CONT.)

46	47	44	45	46
46	11	31	32	46
46	26	55	38	46
46	6	17	35	46
47	48	49	10	47
47	32	33	5	47
47	44	45	46	47
47	23	24	25	47
48	49	10	47	48
48	19	29	43	48
48	42	30	31	48
48	57	21	22	48
49	50	40	41	49
49	10	47	48	49
49	14	37	56	49
49	4	34	18	49
50	51	52	13	50
50	40	41	49	50
50	35	36	3	50
50	18	19	9	50
51	52	13	50	51
51	24	64	34	51
51	22	32	39	51
51	61	63	17	51
52	53	43	23	52
52	55	58	60	52
52	13	50	51	52
52	27	20	21	52
53	54	53	54	53
53	16	25	26	53
53	43	23	52	53
53	30	62	12	53
54	55	56	42	54
54	53	54	53	54
54	27	28	29	54
54	13	14	15	54
55	56	42	54	55
55	38	46	26	55
55	58	60	52	55
55	21	61	12	55
56	57	56	57	56
56	42	54	55	56
56	19	28	20	56
56	49	14	37	56
57	58	59	41	57
57	21	22	48	57
57	56	57	56	57
57	38	39	18	57
58	59	41	57	58

58	60	52	55	58
58	41	19	20	58
58	45	36	37	58
59	60	22	44	59
59	59	59	59	59
59	45	39	40	59
59	41	57	58	59
60	61	31	44	60
60	22	44	59	60
60	24	17	40	60
60	52	55	58	60
61	62	31	23	61
61	31	44	60	61
61	63	17	51	61
61	12	55	21	61
62	63	25	11	62
62	12	53	30	62
62	62	62	62	62
62	31	23	61	62
63	64	5	11	63
63	7	15	30	63
63	25	11	62	63
63	17	51	61	63
64	2	15	16	64
64	1	5	6	64
64	34	51	24	64
64	5	11	63	64

FIG. 12C

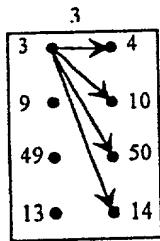


FIG. 13(a)

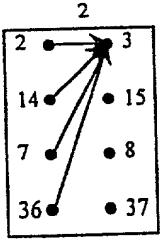


FIG. 13(b)

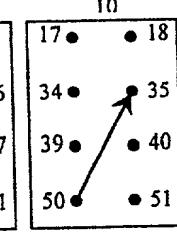
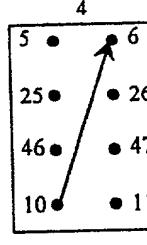
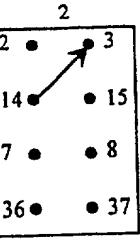
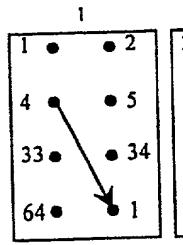


FIG. 13(c)

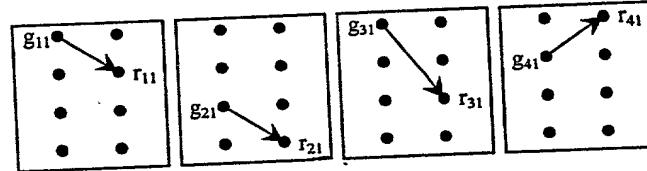


FIG. 14(a)

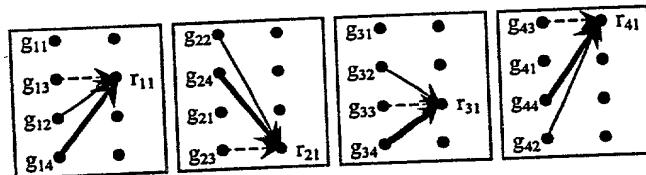


FIG. 14(b)

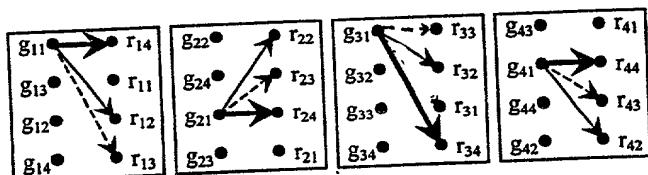


FIG. 14(c)

2
7 3
2 15
14 37
36 8

2	1	4	10
7 3	64 1	25 6	17 35
2 15	1 5	5 11	34 51
14 37	4 34	10 47	50 40
36 8	33 2	46 26	39 18

FIG. 15(a)

FIG. 15(b)

2
7 3
2 15
14 37
36 8

1	4	10
64 1	25 6	17 35
1 5	5 11	34 51
4 34	10 47	50 40
33 2	46 26	39 18

FIG. 15(c)

$$\begin{array}{ccc}
 1 & 2 & 3 \\
 -1 & -2 & -3 \\
 -1 & 2 & -3 \\
 -1 & -2 & 3
 \end{array}
 \quad
 \begin{array}{ccc}
 1 & 2 & -3 \\
 1 & -2 & 3 \\
 -1 & 2 & 3 \\
 -1 & -2 & -3
 \end{array}$$

FIG. 18

$$\begin{array}{ccc}
 1 & 3 & 5 \\
 -1 & 4 & 6 \\
 2 & -3 & -6 \\
 -2 & 4 & -5
 \end{array}$$

$$\begin{array}{cccc}
 1 & 3 & 5 & 1 & -3 & -5 & -1 & 3 & -5 & -1 & -3 & 5 \\
 -1 & 4 & 6 & -1 & 4 & -6 & 1 & 4 & -6 & 1 & -4 & 6 \\
 2 & -3 & -6 & 2 & 3 & 6 & -2 & -3 & 6 & -2 & 3 & -6 \\
 -2 & 4 & -5 & -2 & 4 & 5 & 2 & -4 & 5 & 2 & 4 & -5
 \end{array}$$

(1)

(2)

(3)

(4)

FIG. 19(a)

FIG. 19(b)

$STM(2,3,1)$	$STM(2,3,1)$	$STM(2,3,1)$	$STM(:,3,1)$	$STM(:,1,1)$	$STM(:,1,1)$
1	1	1	2	2	8
	⋮	⋮	1	5	11
			4	7	2
			3	1	14
				6	
					5
					7
					1
					6
					10
					12
					4
					15
					9
					13
					3
					16

FIG. 16(a) FIG. 16(b) FIG. 16(c)

$STM(2,3,1)$	2	$STM(:,1,1)$	2
	1		5
	4		7
	3		1
			6
			4
			3

FIG. 16(d)

$STM(:,1,1)$	2
	5
	1
	6
	4
	3

FIG. 16(e)

$STM(:,1,1)$	8	11	2	14
	5	7	1	6
	10	12	4	15
	9	13	3	16

FIG. 16(f)

$STM(:,2,1)$				$STM(:,3,1)$			$STM(:,4,1)$	
		17			19			

FIG. 16(g)

$STM(:,3,1)$			
	19		

FIG. 16(h)

$STM(:,4,1)$			
	18		

FIG. 16(i)

$STM(:,2,2)$	26	29	20	32	41	44	35	47	56	59	50	62
	23	24	17	25	38	39	19	40	53	54	18	55
	27	30	21	33	42	45	36	48	57	60	51	63
	28	31	22	34	43	46	37	49	58	61	52	64

FIG. 16(j)

$STM(:,3,2)$			
	19		

FIG. 16(k)

$STM(:,4,2)$			
	18		

FIG. 16(l)

STM (2,3)		STM (:,3)	
2	3	7	8

STM (:,:)	
2	3

STM (2,3)	
1	1

1	1
64	2

4	5
33	34

33	34
34	35

17	18
50	51

39	40
5	6

25	26
10	11

46	47
34	35

FIG. 17(a)

FIG. 17(b)

FIG. 17(c)

26	13	8	9	2	3	18	49
12	27	27	28	7	8	48	19

54	53	28	29	14	15	56	42
52	55	19	20	36	37	41	57

6	64	3	4	1	1	35	33
63	7	13	14	64	2	32	36

16	25	9	10	4	5	38	46
24	17	49	50	33	34	45	39

47	32	37	38	34	35	40	45
31	48	55	56	17	18	44	41

43	23	20	21	50	51	58	60
22	44	57	58	39	40	59	59

11	63	15	16	5	6	51	24
62	12	53	54	25	26	23	52

30	62	29	30	10	11	21	61
61	31	42	43	46	47	60	22

FIG. 17(d)

$(1,3,5), (1,-3,-5), (-1,3,-5), (-1,-3,5)$
 $(-1,4,6), (-1,-4,-6), (1,4,-6), (1,-4,6)$
 $(2,-3,-6), (2,3,6), (-2,-3,6), (-2,3,-6)$
 $(-2,-4,-5), (-2,4,5), (2,-4,5), (2,4,-5)$

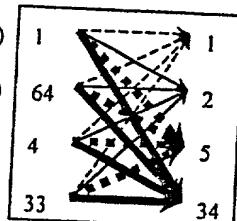


FIG. 20 (a)

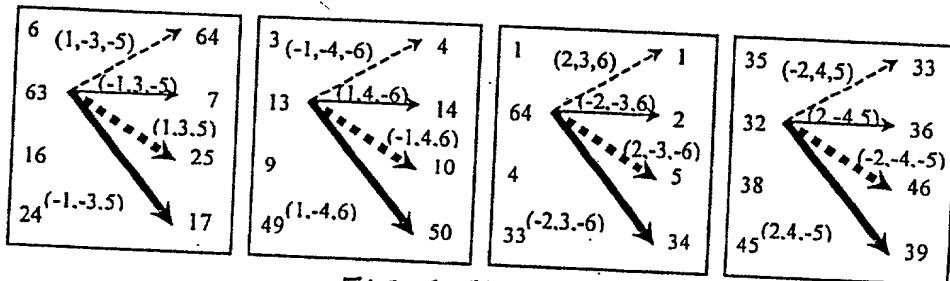


FIG. 20 (b)

1 3 5

1 3 5

1 3 5

-1

-1 4 6

-3

2 -3 -6

-5

-2 -4 -5

FIG. 21 (a)

FIG. 21 (b)

FIG. 21 (c)

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5

IIS(:,1,1)

1	3	5
-1	4	6
2	-3	-6
-2	-4	-5

IIS(:,1,1)

1	3	5	-1	-3	-5
-1	4	6	1	-4	-6
2	-3	-6	-2	3	6
-2	-4	-5	2	4	5

FIG. 22 (a)

FIG. 22 (b)

FIG. 22 (c)

FIG. 22 (d)

IIS(:,1)

1	3	5	-1	17	21	13	-3	-21	-13	-17	-5
-1	4	6	1	18	22	-13	-4	-22	13	-18	-6
2	-3	-6	-2	-17	-22	14	3	22	-14	17	6
-2	-4	-5	2	-18	-21	-14	4	21	14	18	5

IIS(:,1,2)

-1	1	-13	13
1	-1	13	-13
-2	2	-14	14
2	-2	14	-14

FIG. 22 (e)

FIG. 22 (f)

IIS(:,1,3)

-3	-17	3	17
-4	-18	4	18
3	17	-3	-17
4	18	-4	-18

IIS(:,1,4)

-5	-21	21	5
-6	-22	22	6
6	22	-22	-6
5	21	-21	-5

FIG. 22 (g)

FIG. 22 (h)

IIS(:, :, 2)

-1 33 41	1 37 45	-13 -33 -45	13 -37 -41
1 34 42	-1 38 46	13 -34 -46	-13 -38 -42
-2 -33 -42	2 -37 -46	-14 33 46	14 37 42
2 -34 -41	-2 -38 -45	14 34 45	-14 38 41
1 35 43	-1 39 47	13 -35 -47	-13 -39 -43
-1 36 44	1 40 48	-13 -36 -48	13 -40 -44
2 -35 -44	-2 -39 -48	14 35 48	-14 39 44
-2 -36 -43	2 -40 -47	-14 36 47	14 40 43
-7 -33 -43	7 -37 -47	-15 33 47	15 37 43
7 -34 -44	-7 -38 -48	15 34 48	-15 38 44
-8 33 44	8 37 48	-16 -33 -48	16 -37 -44
8 34 43	-8 38 47	16 -34 -47	-16 -38 -43
7 -35 -41	-7 -39 -45	15 35 45	-15 39 41
-7 -36 -42	7 -40 -46	-15 36 46	15 40 42
8 35 42	-8 39 46	16 -35 -46	-16 -39 -42
-8 36 41	8 40 45	-16 -36 -45	16 -40 -41

FIG. 22 (i)

IIS(:, :, 3)

25 -3 -41	-25 -17 -45	29 3 45	-29 17 41
-25 -4 -42	25 -18 -46	-29 4 46	29 18 42
26 3 42	-26 17 46	30 -3 -46	-30 -17 -42
-26 4 41	26 18 45	-30 -4 -45	30 -18 -41
-25 -9 -43	25 -19 -47	-29 9 47	29 19 43
25 -10 -44	-25 -20 -48	29 10 48	-29 20 44
-26 9 44	26 19 48	-30 -9 -48	30 -19 -44
26 10 43	-26 20 47	30 -10 -47	-30 -20 -43
27 3 43	-27 17 47	31 -3 -47	-31 -17 -43
-27 4 44	27 18 48	-31 -4 -48	31 -18 -44
28 -3 -44	-28 -17 -48	32 3 48	-32 17 44
-28 -4 -43	28 -18 -47	-32 4 47	32 18 43
-27 9 41	27 19 45	-31 -9 -45	31 -19 -41
27 10 42	-27 20 46	31 -10 -46	-31 -20 -42
-28 -9 -42	28 -19 -46	-32 9 46	32 19 42
28 -10 -41	-28 -20 -45	32 10 45	-32 20 41

FIG. 22 (j)

IIS(:, :, 4)

-25 -33 -5	25 -37 -21	-29 33 21	29 37 5
25 -34 -6	-25 -38 -22	29 34 22	-29 38 6
-26 33 6	26 37 22	-30 -33 -22	30 -37 -6
26 34 5	-26 38 21	30 -34 -21	-30 -38 -5
25 -35 -11	-25 -39 -23	29 35 23	-29 39 11
-25 -36 -12	25 -40 -24	-29 36 24	29 40 12
26 35 12	-26 39 24	30 -35 -24	-30 -39 -12
-26 36 11	26 40 23	-30 -36 -23	30 -40 -11
-27 33 11	27 37 23	-31 -33 -23	31 -37 -11
27 34 12	-27 38 24	31 -34 -24	-31 -38 -12
-28 -33 -12	28 -37 -24	-32 33 24	32 37 12
28 -34 -11	-28 -38 -23	32 34 23	-32 38 11
27 35 5	-27 39 21	31 -35 -21	-31 -39 -5
-27 36 6	27 40 22	-31 -36 -22	31 -40 -6
28 -35 -6	-28 -39 -22	32 35 22	-32 39 6
-28 -36 -5	28 -40 -21	-32 36 21	32 40 5

FIG. 22 (k)

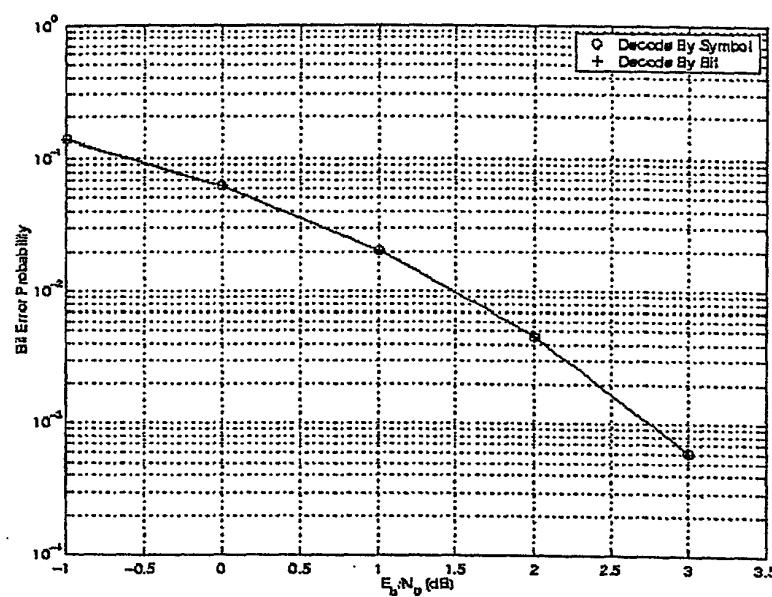


FIG. 23

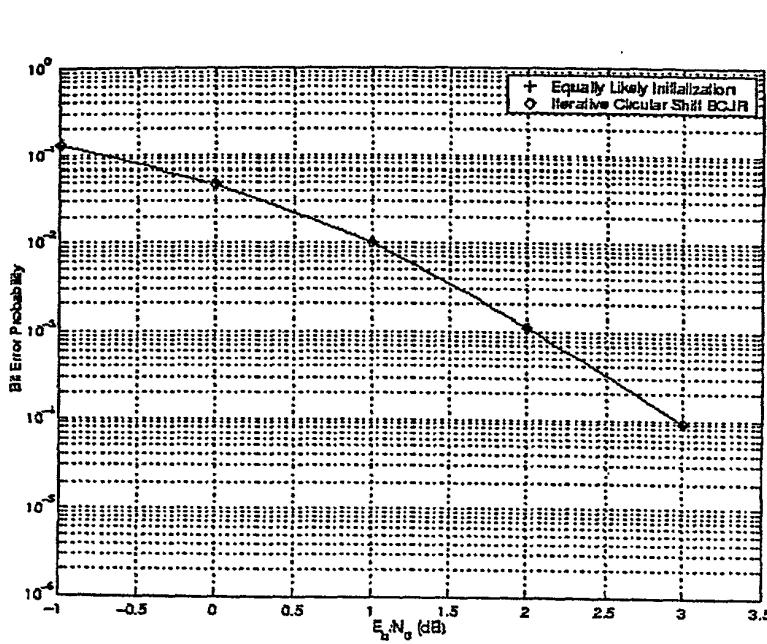


FIG. 26

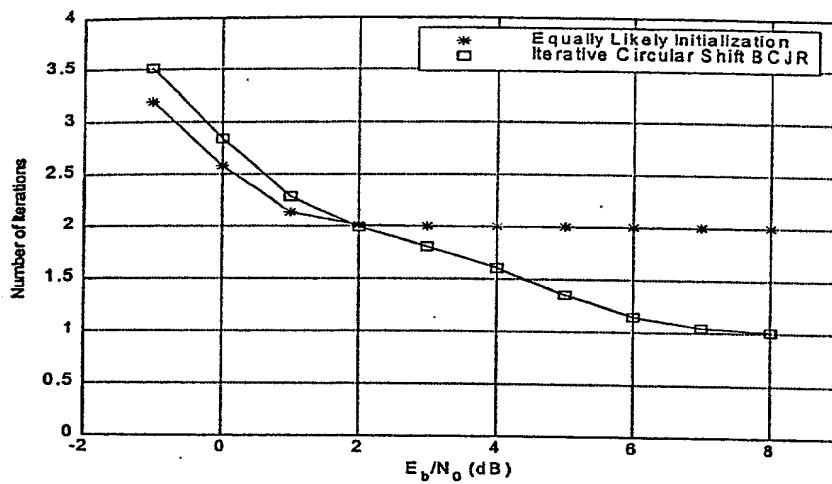


FIG. 24

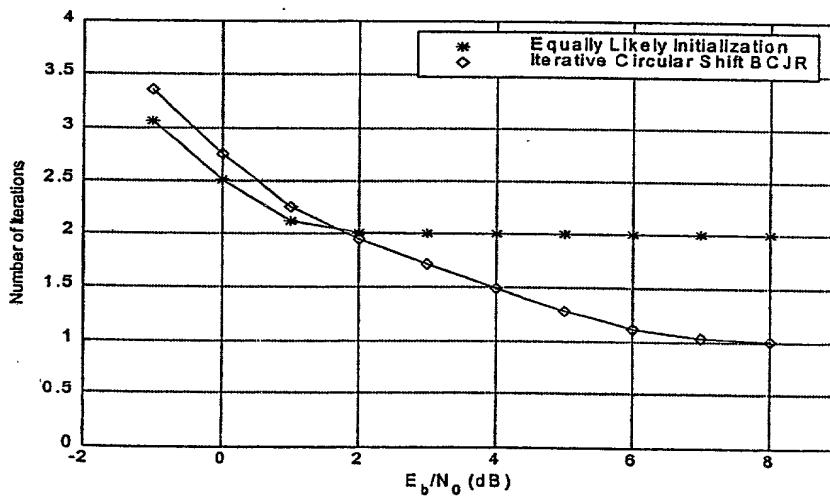


FIG. 25

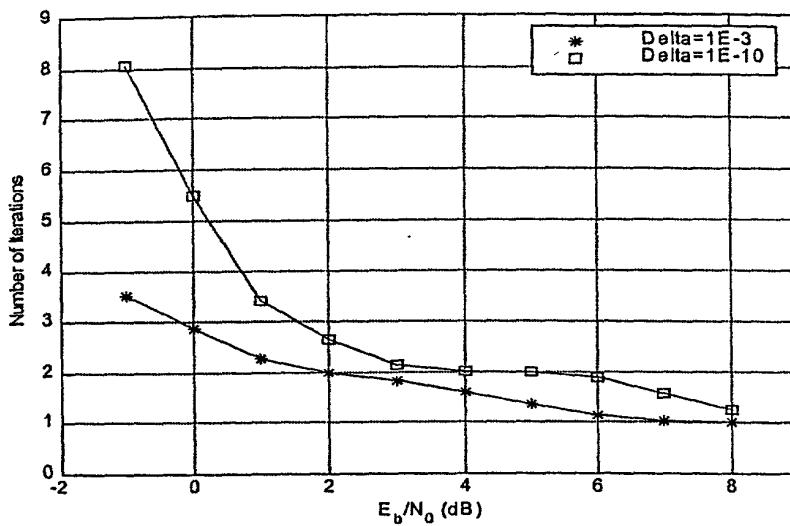


FIG. 27

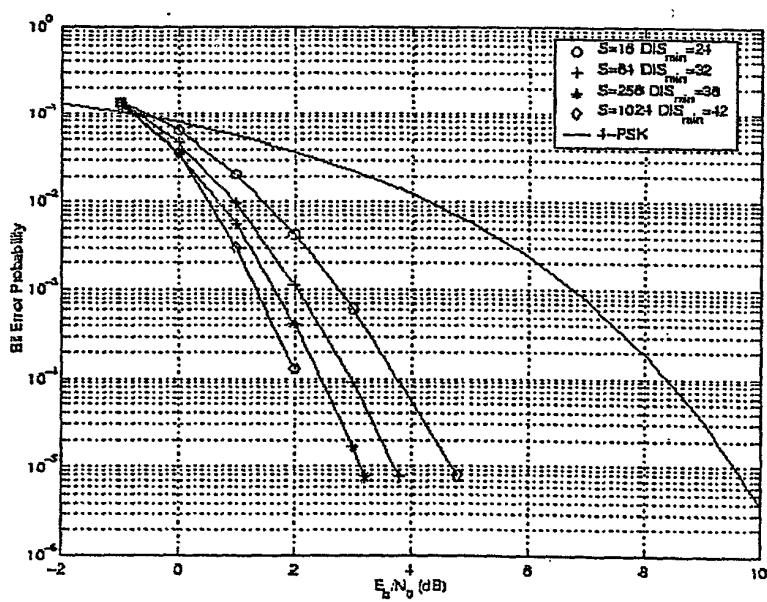


FIG. 32

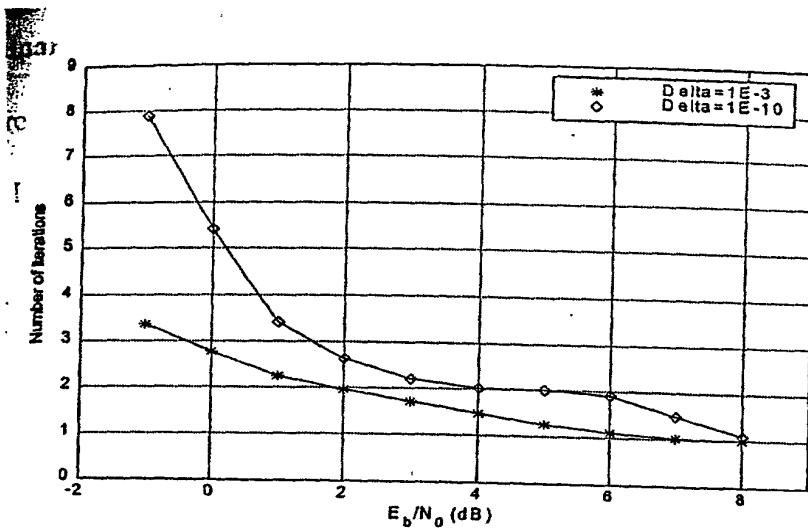


FIG. 28

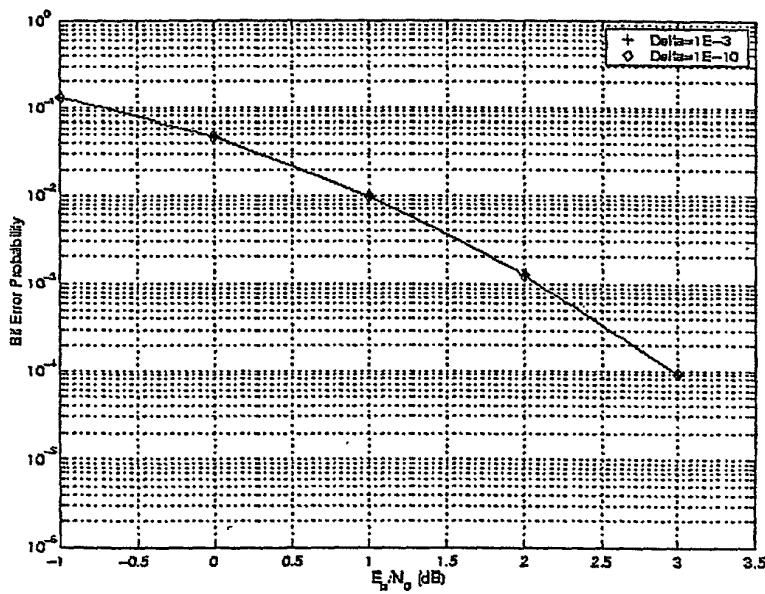


FIG. 29

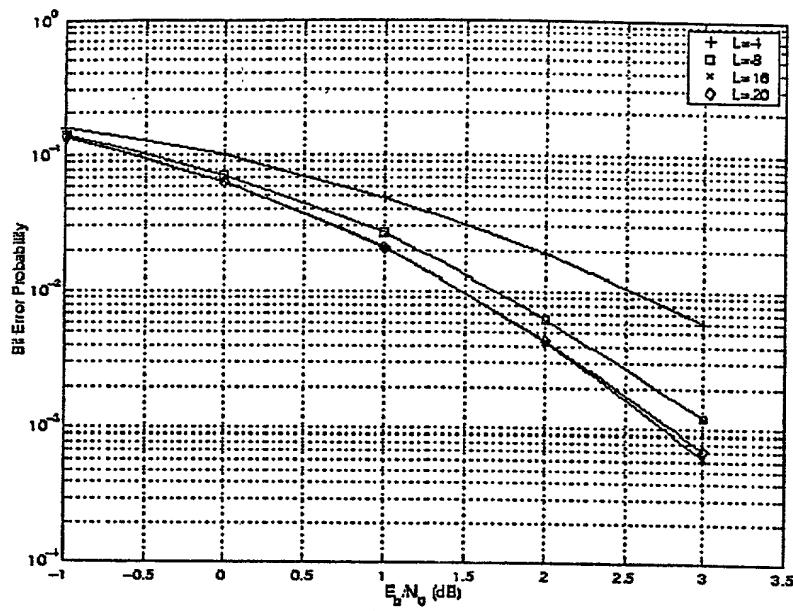


FIG. 30

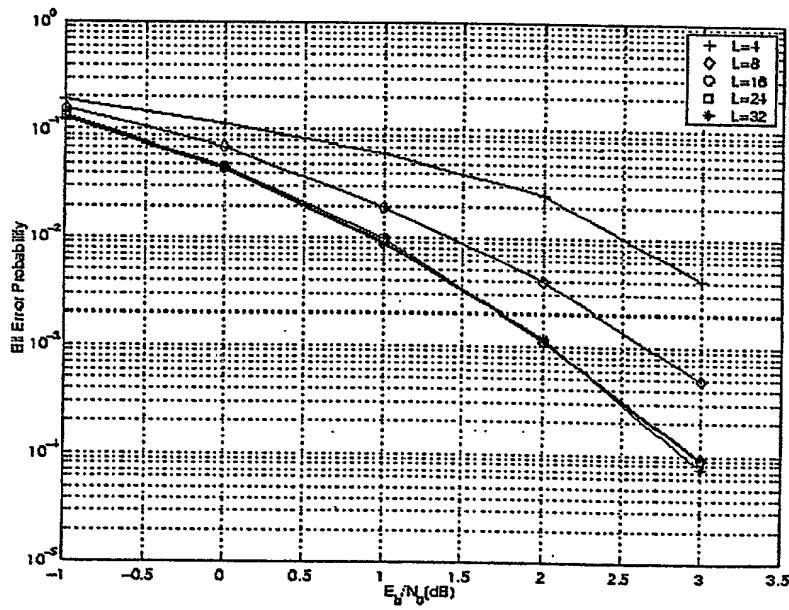


FIG. 31

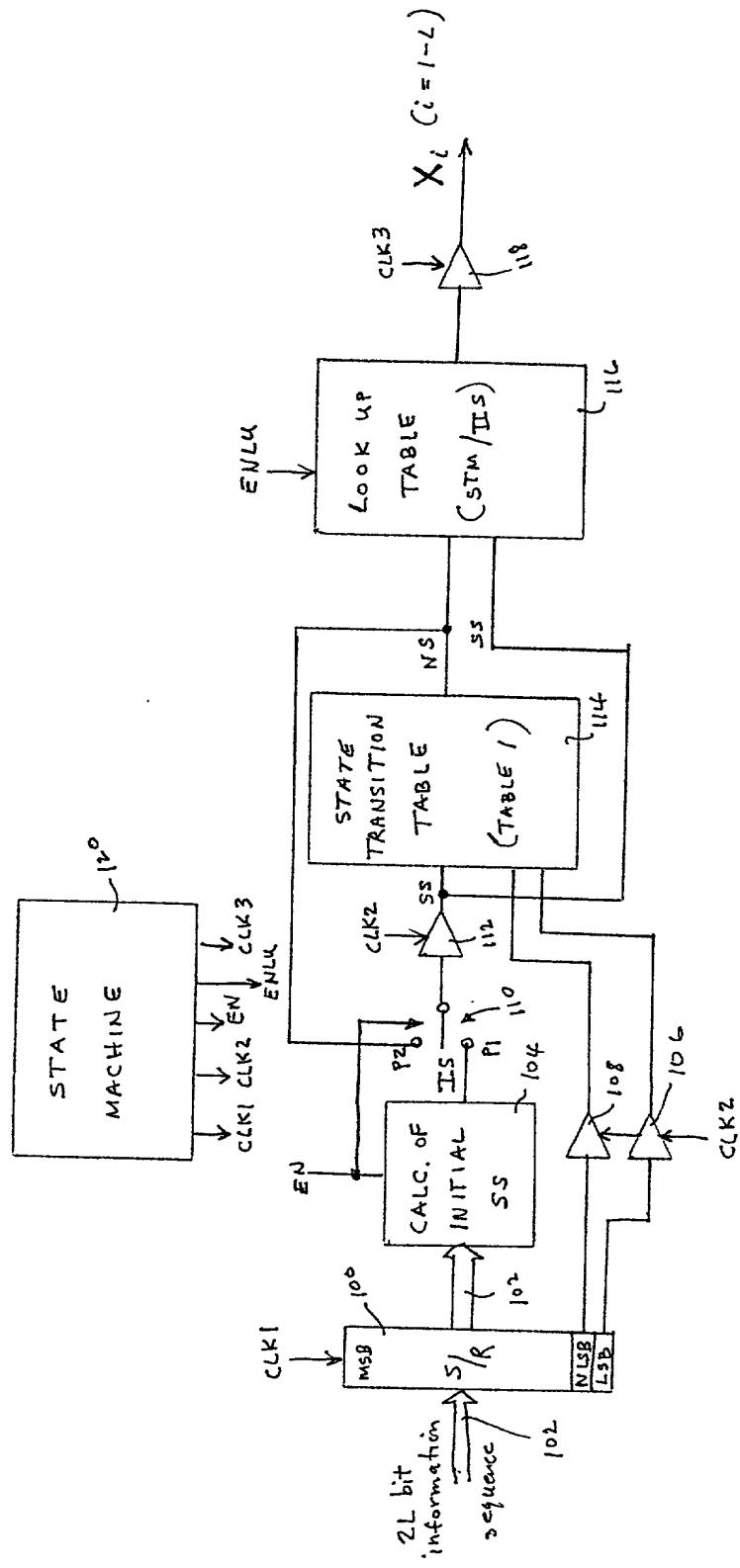


FIG. 33

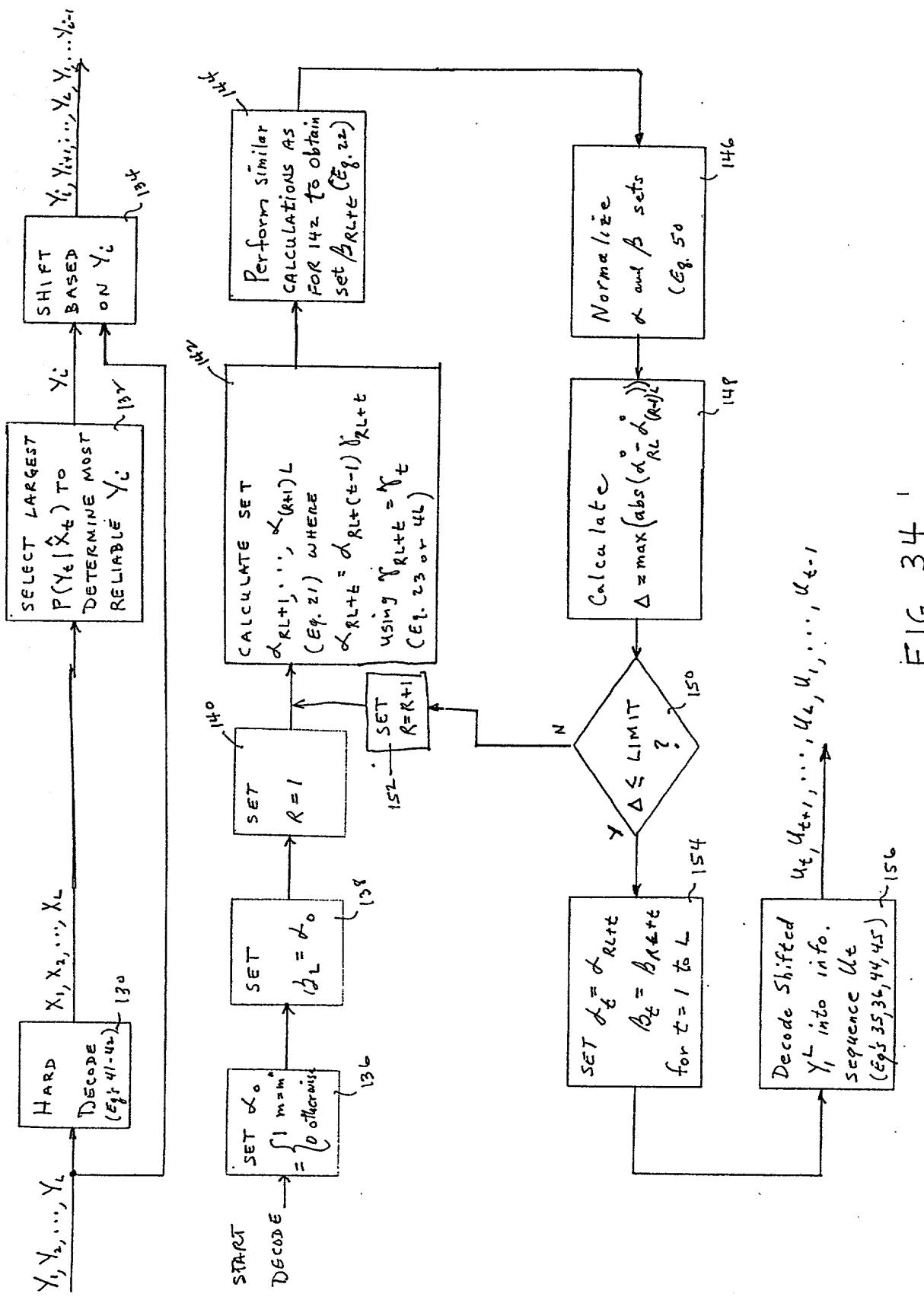


FIG. 34